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# Pyoderma gangrenosum after cardiac surgery masquerading as a fulminant sternal wound infection



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## ABSTRACT

**INTRODUCTION:** Pyoderma gangrenosum (PG) is a rare, ulcerative inflammatory skin pathology frequently associated with systemic inflammatory disease. While rare after surgery, recognition of this disease in the post-surgical setting is important as it can mimic wound infection. There have been ten case reports to date of PG occurring immediately after cardiac surgery, with all of them presenting within the first week post-operatively.

**PRESENTATION OF CASE:** We herein present a delayed and dramatic presentation of PG nine days after mitral valve replacement and repair of patent foramen ovale, two days after being discharged with a seemingly normal healing wound. Diagnosis of this disease in the postoperative period requires high suspicion when the characteristic ulcerative lesions are seen diffusely in all surgical wounds and show minimal improvement with antibiotic treatment or debridement.

**DISCUSSION/CONCLUSION:** Our case highlights the importance of recognizing this disease in the postoperative period, even in a delayed presentation and initially limited to one of the surgical sites. This case calls for an awareness of this disease entity amongst cardiac surgeons as well as intensivists.

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## 1. Introduction

Pyoderma gangrenosum (PG) is a rare inflammatory disease of the skin often associated with systemic inflammatory disease or immunodeficiency.<sup>1</sup> Although rare, it is known to occur following trauma or operative procedures.<sup>2</sup> To date nine cases have been reported following cardiac surgery, all within the first postoperative week.<sup>3–12</sup> We report a delayed presentation of PG in a patient undergoing mitral valve replacement who was discharged home on postoperative day seven with a normal healing incision and presented two days later with a necrotic-appearing lesion which was later diagnosed as PG.

## 2. Presentation of case

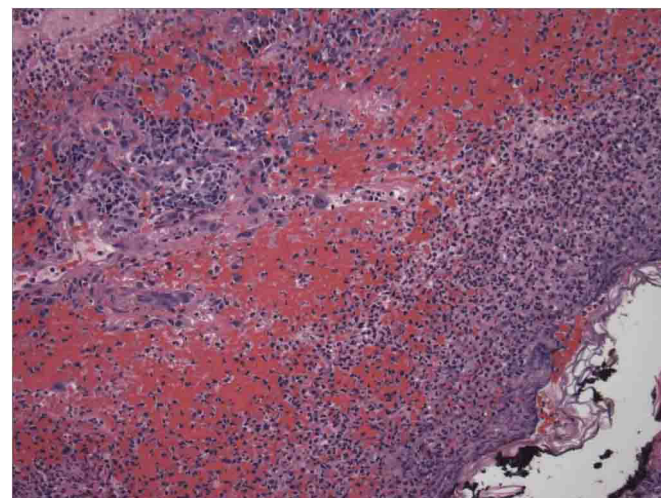
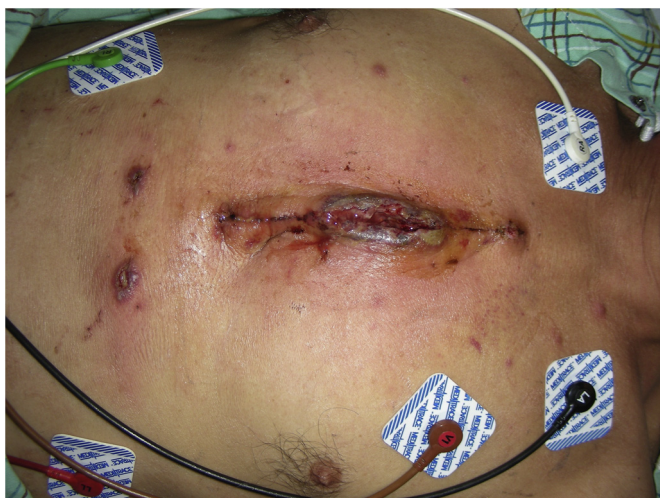
A 52-year old Hispanic male was admitted with new shortness of breath at rest. His prior medical history included repair of a cleft palate and a heart murmur. On admission, he was noted to have a new onset atrial fibrillation. Echocardiogram revealed severe mitral regurgitation with a flail and ruptured posterior mitral leaflet, a

patent foramen ovale, pulmonary hypertension, and a markedly dilated left atrium without any vegetations. Mitral valve repair and closure of patent foramen ovale were undertaken via a median sternotomy utilizing a short skin incision. His recovery was uneventful, and he was discharged home on postoperative day seven with a normal healing incision.

Two days after discharge, he presented with drainage from the sternum. Physical examination revealed a stable but alarmingly swollen sternal wound with necrotic margins along the entire length (Fig. 1). The wound was incised with minimal serosanguinous drainage. The patient was afebrile and hemodynamically stable but was admitted with a presumed wound infection and was started on intravenous vancomycin and cefepime. Laboratory work demonstrated a normal white blood cell count of 8.7, elevated C-reactive protein of 8.8 mg/dL (normal: 0.0–1.0), and an elevated erythrocyte sedimentation rate of 44 mm/h (normal: 0–13). The following day, his two chest tube sites demonstrated similar lesions. The wounds failed to improve, and after three days of antibiotics, the sternal wound was opened at the bedside and negative pressure wound therapy was initiated. Similar lesions blossomed at the sites of previous internal jugular line and subcutaneous heparin injection. On hospital day five, the patient was taken to the operating room for debridement. Interestingly, the wound demonstrated minimal purulence, a healing sternum, and persistent superficial necrosis. All sternal wound cultures remained negative; however,

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**Fig. 1.** Swollen sternal wound with necrotic margins along the entire length of the wound on both sides of the closed incision as well as chest tube sites demonstrated similar lesions.

**Fig. 2.** Hematoxylin- and eosin stain of wound biopsy ( $\times 200$ ) demonstrating granulation tissue with detached acute inflammatory exudate and marked reactive change, consistent with the diagnosis of pyoderma gangrenosum.

the chest tube wound grew methicillin-resistant *Staphylococcus aureus*.

Due to the lack of response to debridement and antibiotics, a dermatology consult was obtained. An 8-mm punch biopsy demonstrated granulation tissue with detached acute inflammatory exudate and marked reactive change (Fig. 2). A diagnosis of pyoderma gangrenosum was made, and the patient was started on oral prednisone 80 mg daily. After initiation of prednisone, healing was noted. Prednisone was slowly tapered starting ten days after initiation, and the patient was discharged home on a tapering dose of oral steroids. The wound healed completely by secondary intention.

### 3. Discussion

The diagnosis of PG in a postoperative setting is difficult as the wound may mimic an infection. Making a prompt diagnosis is

crucial in preventing morbidity. In fact, a recent case report shows a death resulting from PG when the disease involved the saphenous vein graft.<sup>12</sup> To date, all ten case reports of PG after cardiac surgery have occurred in the initial week postoperatively (Table 1). What makes our case unique is the delayed presentation (postoperative day nine), just 2 days after he was discharged with a seemingly normal healing wound.

The clinical challenge in PG involves (1) making a prompt diagnosis and (2) choosing the appropriate treatment. PG in the postoperative period should be considered when the characteristic ulcerative lesions are seen diffusely in all surgical wounds and show minimal improvement with antibiotic treatment or debridement. This was the case in our patient, who presented with necrotic lesions not only all along on his sternotomy wound, but also involving his chest tube sites and his central venous catheter site. These did not show any improvement after a course of antibiotics nor after debridement in the operating room. Once suspected, prompt

**Table 1**  
Cases of pyoderma gangrenosum following cardiac surgeries.

Reference	Day of onset postoperative	Operation	Sites involved	Therapy	Outcome
Rand et al. <sup>3</sup>	6	CABG	Sternal wound, saphenous vein harvest site	Corticosteroids	Cure
Goldberg et al. <sup>4</sup>	2	CABG	Saphenous vein harvest site	Cyclosporin A	Cure
Koss-Harnes et al. <sup>5</sup>	3	CABG	Sternal wound, saphenous vein harvest site	Cyclosporin A	Cure
Samuels et al. <sup>6</sup>	3	CABG	Sternal wound	Corticosteroids	Cure
Gleichmann et al. <sup>7</sup>	4	CABG	Sternal wound	Corticosteroids, immunoglobulin	Cure
Rothenberger et al. <sup>8</sup>	3	Aortic valve replacement	Sternal wound	Corticosteroids, clofazimine, cyclosporine A	Cure
Madershahian et al. <sup>9</sup>	5	CABG	Sternal wound, saphenous vein harvest site, chest tube site	Corticosteroids	Cure
Mariscalco et al. <sup>10</sup>	5	CABG	Sternal wound, saphenous vein harvest site	Corticosteroids	Cure
Sebastian et al. <sup>11</sup>	4	CABG	Sternal wound, saphenous vein harvest site, intravenous sites	Corticosteroids	Cure
Bryan <sup>12</sup>	6	CABG	Sternal wound, saphenous vein harvest site, chest tube site, recent abdominal wound	Corticosteroids, mycophenolate	Death from perforation of exposed saphenous vein graft
Present case	9	Mitral valve replacement	Sternal wound, saphenous vein harvest site, chest tube site, central line site, subcutaneous heparin injection sites	Corticosteroids	Cure

CABG: coronary artery bypass graft.

dermatology consultation and skin biopsy aids in confirming the diagnosis.

The second challenge is selecting the appropriate treatment as there is no established standard. In previous reports of PG after cardiac surgery, treatments with prednisone, cyclosporine A, or a combination of both have been successful. Cyclosporine A might avoid the adverse effects of prednisone on wound healing. Our patient was treated with a course of oral prednisone alone and showed rapid and marked improvement. The other question concerning treatment is whether antibiotics are necessary. Although the pathology of PG is not infectious, the lesions compromise the skin barrier significantly, and PG is known to be associated with an underlying immuno-deficient state. In our patient, antibiotics were administered for a presumed wound infection. In fact, one of the wounds from our patient grew methicillin-resistant *Staphylococcus aureus*. While there is no evidence to initiate antibiotics, we do recommend coverage for super-infection.

#### 4. Conclusion

In conclusion, PG is a rare complication after cardiac surgery, yet an important entity to recognize as prompt diagnosis is necessary to initiate appropriate treatment. While all other reported cases have

occurred within the first week of postoperative period, our case demonstrates that PG can present in a delayed fashion. PG should be suspected when ulcerative lesions appear acutely and diffusely in all surgical wounds and respond minimally to debridement and antibiotic treatment.

#### Conflict of interest

None declared.

#### Ethical approval

None declared.

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None.

#### Author contributions

KS was involved in data collection and writing. ES was involved in writing. RT was involved in data collection and writing. DH was involved in study design and writing.

#### Key learning points

- Pyoderma gangrenosum can occur following cardiac surgery and can mimic wound infection.
- Making the clinical distinction between pyoderma gangrenosum and wound infection is very important as the treatment is different.

#### Acknowledgment

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